

troscopic, and other observations that require special instruments, but the following extracts may be of use to most observers :—Drawings of the corona have only seldom proved to be of great utility. If such drawings are attempted on the present occasion, observers ought to pay attention to the general outline of the corona rather than to points of detail. A plumb line ought to be suspended, if possible, between the observer and the sun, so as to fix the position of the corona in the sky as accurately as possible. The vertical line ought to be indicated on the drawing. Observers will find it useful to draw the black disk of the sun and the vertical line before the beginning of totality. . . . Observers unpractised in accurate drawing will obtain more useful results by paying attention to certain features of the corona than by attempting what can only be a very rough and inaccurate sketch of the corona. Definite answers as to the following questions, for instance, would be of great value :—(a) To what distance from the sun, estimated in solar diameters, can you trace the corona? (b) Does it extend further in some directions than in others, and what are the directions of greatest and least extent? (c) Is there a line of approximate symmetry in the corona, and what is the direction of that line? The answers to the last two questions ought, if possible, to be given in angles from the vertical line, or from some definite great circle.

II. "On the Total Solar Eclipse of September 9, 1885 (in a Letter to J. N. LOCKYER, F.R.S.)." By A. S. ATKINSON. Received November 19, 1885.

I observed the eclipse from a spot in my own ground in Nelson, which, as determined for the transit of Venus, is in lat. $41^{\circ} 17' 1.9''$ S., and long. $173^{\circ} 17' 57.5''$ E.

The sky was very clear, and there was no wind, but the air was optically very unsteady.

As totality was approaching, perhaps two or three minutes before, I tried with the telescope (5-in. Cooke, power 60) if I could see anything of the corona behind the moon, but could not in the time I allowed myself; I was afraid of waiting longer, as I had made arrangements for taking some small photographs, and had to superintend; and as I wished also to answer the questions of the Committee of the Royal Society, I thought it best to observe the main phase with the naked eye.

I may, perhaps, note here, that in finding my way with the telescope to the moon's following limb, I chanced upon Jupiter, the appearance

of which surprised me greatly. It was, of course, "boiling" a good deal, but at the moment I caught sight of it, it seemed to have one broad uniform equatorial belt, with at least its northern edge rather sharply marked; in breadth it seemed about one-third of the planet's (polar) diameter, and in colour distinctly pink. This belt disappeared and reappeared with the motion of the air. I shifted my eye in the telescope, but the breadth and colour seemed constant on each reappearance, so long as I looked, which was not, however, very long.

As the sun was just disappearing, the most striking phenomenon I noticed, looking straight at it, was a strongly marked pulsation in its light; those who were looking away from it saw waves of shadow passing rather rapidly over the ground. This also, I supposed, was from the unsteadiness of the air, but to me it seemed not the least striking part of the great spectacle to see the sun flickering as it were before it went out.

The following are my answers to the questions of the committee:—

a. I estimated the greatest distance from the moon's limb to which I could trace the corona as from two-thirds to three-fourths of a diameter.

b. The corona extended much farther in one direction than in any other. By far the greatest feature in the corona was a broad-based but hollow-sided cone of white light, with well-marked edges, and a rather sharp point, the axis of which I judged to be from 40° to 45° from the perpendicular towards the west. The "least extent" of the corona, as I saw it, was the same in several places, where there was only a narrow rim of light round the moon's limb. There were other smaller but more or less similar prominences of pure white light, all of which, I may say, gave me the idea of radiating from the sun's centre.

c. There was, in my opinion, no line of "approximate symmetry" in the corona. I looked right round the sun with a view to answer this question, and that was the conclusion I came to without hesitation. As there was nothing to balance the large "cone," the nearest approach to symmetry would have been obtained by taking its axis as the line, but I should not have called the result of this division "approximately symmetrical."

The only red prominences I saw were a row of six or seven small ones (Bailey's beads?) extending from about the vertex towards the east. Large ones were seen by others, and I believe are those which alone appear in the photographs.

Mr. J. R. Akersten obtained for me two photographs during totality, one immediately after it began with an exposure of probably a little less than a second; the other a few seconds later, with about double the exposure. A third plate was all but ready when the sun

reappeared ; it was taken just afterwards, but still shows some of the "red flames."

I took the duration of totality with a stop-watch, but afterwards by a momentary inadvertence lost the record.

I may add that at a time which I estimated to be from 15 to 20 seconds after the sun's reappearance, I could with the naked eye easily see the coronal light round the preceding limb of the moon, and called the attention of the bystanders to the fact.

In conclusion I would add as some evidence of the clear sky which we commonly get in Nelson, that from my own knowledge not only the whole of this eclipse, but egress in both the late transits of Venus, could not have been better seen than from this place.

(Signed) A. S. ATKINSON.

III. "Report on a Series of Specimens of the Deposits of the Nile Delta, obtained by the recent Boring Operations." By J. W. JUDD, F.R.S., SEC. G.S., Professor of Geology in the Normal School of Science and Royal School of Mines. Communicated by desire of the Delta Committee. Received November 12, 1885.

Neither of the borings made for the Royal Society, under the superintendence of the Engineers attached to the Army of Occupation in Egypt, appears to have reached the rocky floor of the Nile-Valley, nor do the samples examined show any indication of an approach to such floor. What were at first supposed to be pebbles in one of the samples from Tantah, prove on examination to be calcareous concretions ("race" or "kunkur").

Nevertheless these borings appear to have reached a greater depth than all previous ones in the same district, except the boring made near the Barrage, which is said to have attained a depth of 122 feet without reaching the rock, and one at Rosetta which exceeded 153 feet. The deepest boring made by the French engineers in 1799, that at Siut, attained a depth of 77 feet $7\frac{3}{4}$ inches ; at a later date M. Linant de Bellefonds (Linant Bey) carried a boring near the apex of the Delta to the depth of 72 feet. In the case of the excavations made for Mr. Horner about thirty years ago, with the aid of a grant from the Donation Fund of the Royal Society, few of the borings exceeded 50 feet in depth ; the deepest being that at Memphis, which reached 59 feet 10 inches. The three borings now reported upon have been carried to depths of 45, 73, and 84 feet respectively.

The samples from these borings, like those examined by Mr. Horner, show that the delta-deposits all consist of admixtures, in